



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,144	10/31/2003	Douglas D. Boom	5038-331	2967

32231 7590 04/26/2006

MARGER JOHNSON & MCCOLLOM, P.C.
210 SW MORRISON STREET, SUITE 400
PORTLAND, OR 97204

EXAMINER

KIM, KENNETH S

ART UNIT PAPER NUMBER

2111

DATE MAILED: 04/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,144

Applicant(s)

BOOM ET AL.

Examiner

Kenneth S. KIM

Art Unit

2111

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

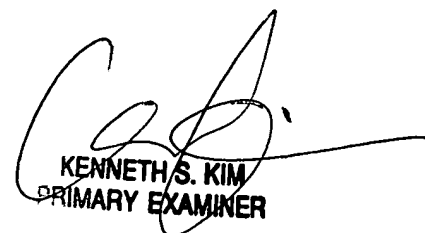
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17-23 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 17-23, and 25-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


KENNETH S. KIM
PRIMARY EXAMINER

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. Claims 1-15, 17-23, and 25-28 remain for examination.

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 3, 4, 11-13, and 25-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicant failed to adequately teach (a) how to retire back to cache executed instructions or executed micro-instructions and (b) inserting micro-opcodes corresponding to interrupt servicing instructions into an instruction sequence within the instruction cache, and it would require an ordinary skill in the art undue experimentation to develop and use such methods.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-15, 17-23, and 25-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- (a) Claim 1, it is not clear what is meant by "bandwidth being allocated" within the context of the claim.
- (b) Claim 3, it is not clear how micro-opcodes are fetched for re-execution, since the fetch unit fetches only the instructions. The specification is silent as to what fetches the micro-opcodes and does not teach how they are fetched.
- (c) Claim 10, the same as (a).
- (d) Claim 11, it is not clear how the micro-opcodes corresponding to interrupt servicing instructions are inserted into an instruction sequence within the instruction cache, what is the use of the micro-opcodes, and how they are fetched for use.
- (e) Claim 13, the same as (c),
- (f) Claim 14, it is not clear whether "instruction" and "p-code" are used synonymously in the claim as well as in the specification.
- (g) Claim 14, "said instruction cache" lacks antecedent basis, and it is not clear what executes instructions and where the instructions are coming from for execution.
- (h) Claim 22, it is not clear what is the use of the signal after detecting an impending natural context switch.
- (i) Claim 25, it is not clear how the micro-opcodes are retired back into the instruction cache, what is the use of the retired micro-opcodes and how they are fetched for use.
- (j) Claim 25, "the decoded micro-opcodes representing interrupt servicing instructions into an *instruction* sequence" appears to be in error, since dispatch and execution units do not handle instructions.

(k) Claim 28, the same as (i), "the instruction cache" lacks antecedent basis, and it is not clear where the executed micro-opcodes come from.

Applicant is requested to check whether limitations in dependent claims are consistent with amendment to base claims.

Applicant is reminded that, upon clarification, some groups of claims may be subject to restriction requirement.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 2, 5-9, 11, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Arora et al, U.S. Patent No. 6,625,693, cited in the previous office action.

The rejection is respectfully maintained for the reason set forth in the previous office action incorporated herein by reference. An exception is handled upon an interrupt raised by the exception, and the interrupt is detected to handle the exception. The exception handlers are inserted into a queue or a pool (col. 3, lines 37 and 46 or into a cache (col. 3, line 52). (See specification page 13, line 28, "interrupt or

exception handling"). The most recently occurring exception handler is inserted into the splice cache (col. 3, line 56).

8. Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Crump et al, U.S. Patent No. 5,557,759, cited in the previous office action.

The rejection is respectfully maintained for the reason set forth in the previous office action incorporated herein by reference. A micro-coded engine executes micro-opcodes obtained by decoding instructions. Interrupt servicing instructions are inserted into the cache only when it is not already present (upon a miss), in the same manner as described in the specification of the present application.

9. Applicant's arguments filed March 27, 2006 have been fully considered but they are not persuasive.

Applicant argued that Arora et al does not teach (a) interrupt servicing instructions but exception handlers (b) purposeful allocation of bandwidth, and (c) prioritizing concurrently occurring interrupts and that Crump et al does not teach (d) detection of an interrupt service request, (e) bandwidth allocation, and (f) out-of-order execution.

As to (a) above, an exception handler comprises instructions for handling (servicing) the respective exception, and as such is synonymous with interrupt servicing instructions comprising instructions to service an interrupt.

As to (b) and (e) above, bandwidth is allocated when components share a resource, and the claims do not recited any specific characteristics of allocation to distinguish over such an allocation.

As to (c) above, various types of prioritizing interrupts are well known in the art.

As to (d) above, an interrupt can only be serviced when it is detected, and an interrupt occurs when it is detected..

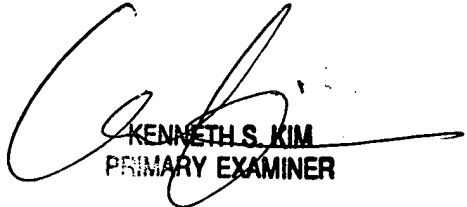
As to (f) above, the claims or the specification does not describe details of out-of-order execution including enabling means but merely recites the limitation as an embodiment incorporating a well known feature.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth S KIM whose telephone number is (571) 272-3627. The examiner can normally be reached on M-F (8:30-17:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart can be reached on (571) 272-3632. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for all communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2100.

April 20, 2006


KENNETH S. KIM
PRIMARY EXAMINER